

Ecosystem Resilience

Building the resilience of natural capital, ecosystem services, and the communities they support

Simon Young, WTW Climate and Resilience Hub, January 2022



WTW's Global Ecosystem Resilience Facility

Applying a risk lens at the nexus of climate change and biodiversity loss



Consulting projects: Focused on innovation and R&D of novel tools and solutions, with a global focus and including terrestrial, coastal, and marine ecosystems

Strategic engagements: Across public and private sectors, from investors to conservationists, with over a dozen partnerships, most new to WTW

From global advocacy to local solutions: Client-focused delivery of services and solutions, converting concepts to protection and resilience

Cross-cutting collaborations: Leveraging our breadth, depth, and internal expertise to identify, quantify, and manage climate and other risks to natural assets

Areas of Engagement

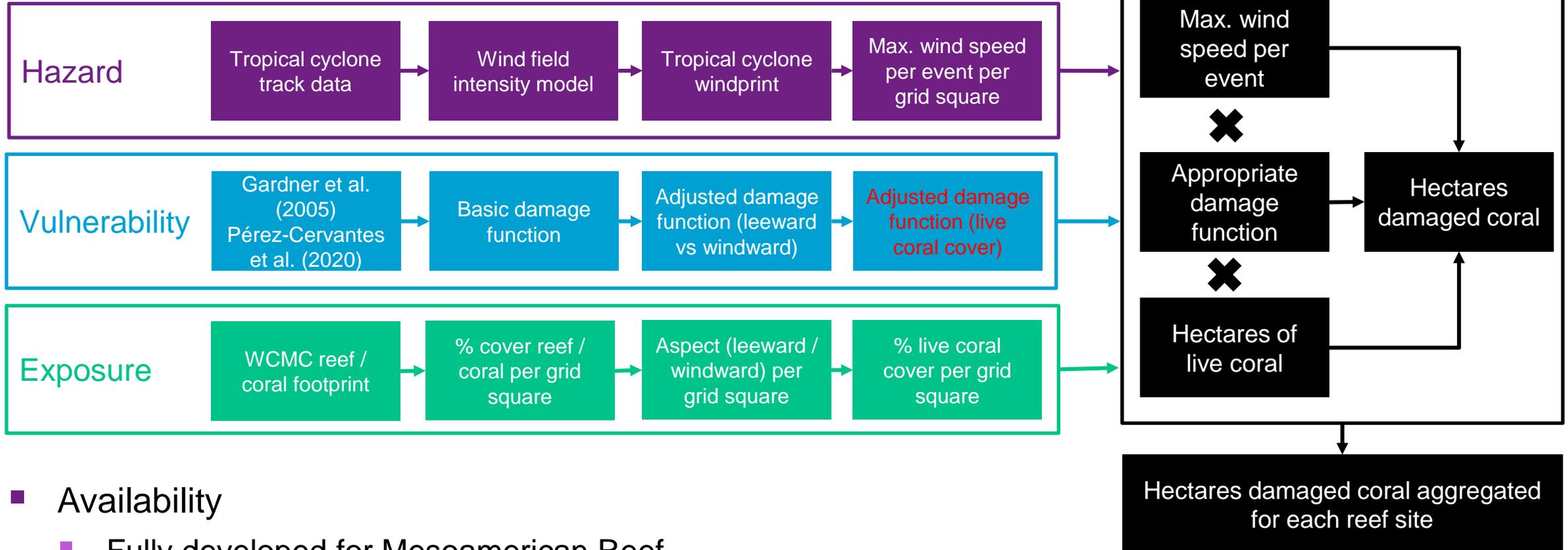
Risk Understanding

- Catastrophe risk modelling for acute hazards (e.g., hurricane reef risk model)
- Climate risk modelling for chronic / slow-onset hazards (e.g., coral bleaching model)
- Ecosystem asset and services valuation
- Benefit-cost analysis for evaluating risk financing options
- Price-signalling to incentivise changes in policy and polluting activities

Risk Financing

- Protect assets and investments in conservation and maintenance of marine ecosystems as assets, pre-funding post-disaster recovery and rejuvenation
- Provide economic relief in the face of disruption to economic activity due to the loss of value provision by natural assets (i.e., 'Business Interruption' cover)
- Increase financial resilience of coastal communities, incentivising stewardship of the marine environment through providing insurance as reward
- Capturing of risk reduction benefits of ecosystems to re-invest in maintenance / conservation

Cyclone reef damage model

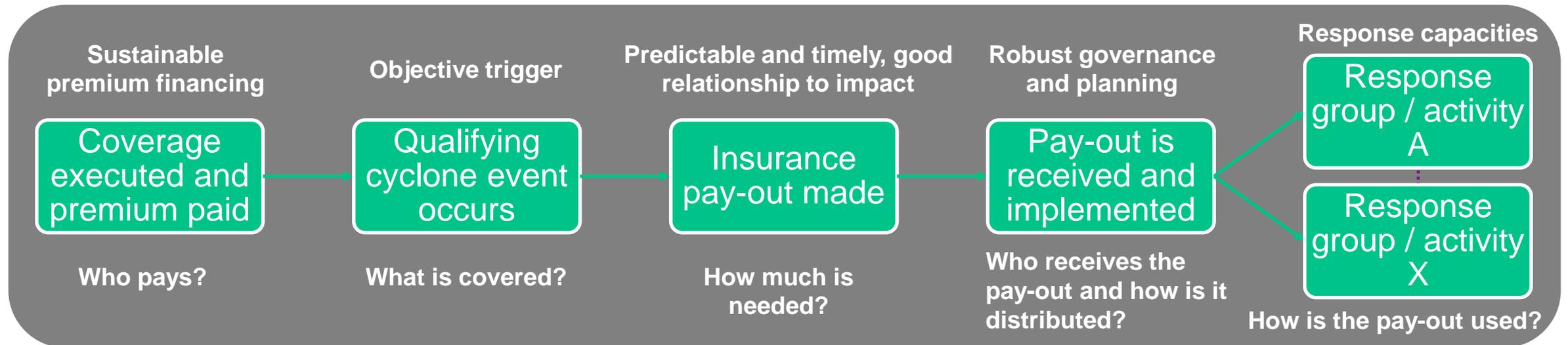


- Availability
 - Fully developed for Mesoamerican Reef
 - Near completion for insular Caribbean reef areas
 - Intention is to complete global model during 2022

What is parametric insurance?

- A risk financing instrument that pays out a pre-agreed amount to a policy holder according to pre-defined event characteristics (e.g., rainfall quantity)
 - The pre-defined event characteristics are selected such that they effectively proxy loss, damage, or impact
 - Thresholds are set to “trigger” pay-outs if pre-agreed event parameters are met

What do you need?



Parametric insurance of blue infrastructure

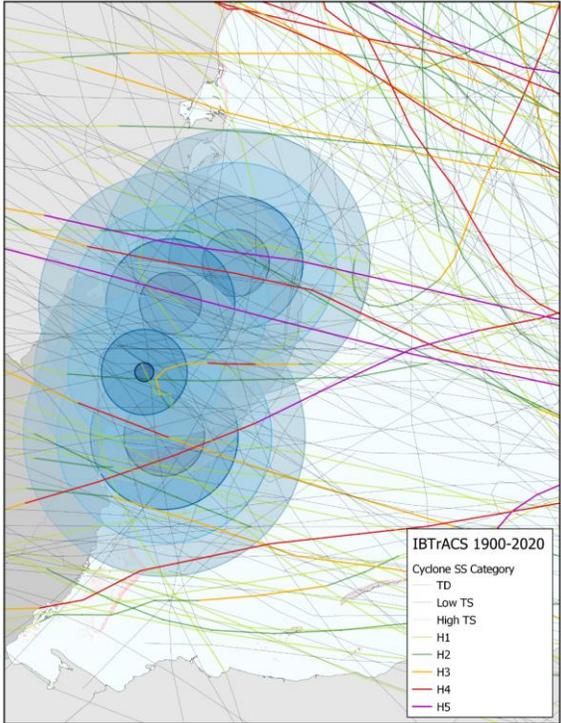
Use cases relevant to coral reefs

- Parametric trigger for cyclones
 - Could be done for heavy rain or bleaching also
- Can fund:
 - Rapid reef clean-up - funding early response which has great value in reef recovery after cyclones, and can incentivise planning – MAR Fund example
 - Pay-outs could be used to give cash payments to fisherfolk to not fish or provide other social benefit support to ease post-cyclone stress on reef
 - Could be more general hedge against revenue interruption for MMA type model – Punta Cana example
 - Can be used by sovereigns to support coastal communities or protect against debt default – Belize example



Example: Parametric reef insurance for rapid response

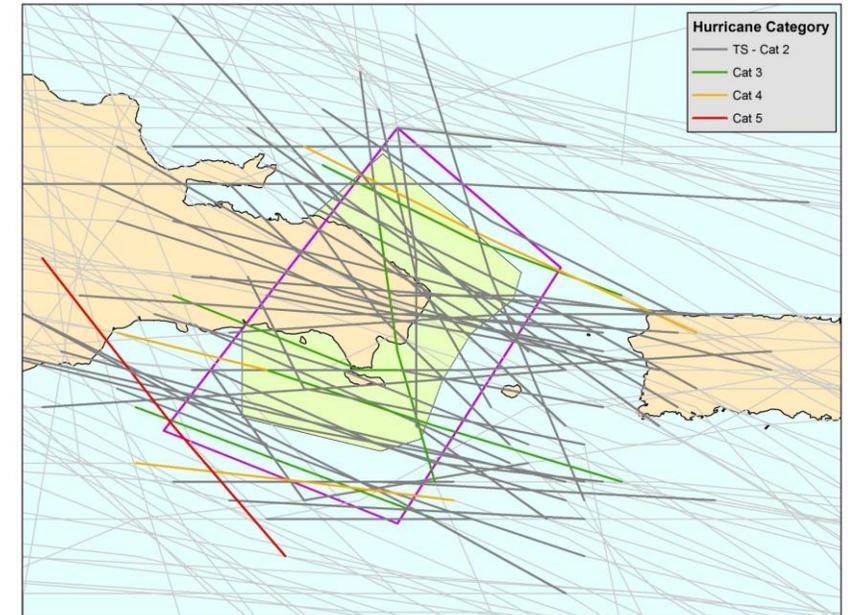
- Under the Mesoamerican Reef Insurance Programme funded by the German Government, WTW structured a parametric product to cover four reef sites for the 2021 hurricane season
 - The structure is validated against the full reef damage model and its simplicity enabled quick placement at an extremely low per-risk cost
 - Pay-outs will flow through MAR Fund’s Emergency Fund directly to trained brigades – funding rapid implementation of pre-agreed response plans
- “Cat-in-nested-circles” Structure
 - Each of the four sites has a central area which is the smallest circle which can accommodate all of the reef area for the site, and three circles outside that
 - The category of hurricane has a corresponding pay-out percentage, applied to a limit for each site, and an overall cap of \$2.5mn for the year
- For 2022 hurricane season, cover will be expanded to an additional four sites on the MAR, including in Guatemala and Honduras, where training of reef brigades is being completed
- Under separate funding from the UK Government, development of a parallel programme in the insular Caribbean has started, which will hopefully including coverage being in place in 2022



Trigger Min (kn)	Hurricane Category	Zone A	Zone B	Zone C	Zone D
0	0	0%	0%	0%	0%
64	1	0%	0%	5%	10%
83	2	0%	5%	10%	20%
96	3	5%	10%	20%	40%
113	4	10%	20%	40%	80%
137	5	20%	40%	80%	100%

Example: Business Interruption for MMA operations

- Eastern Dom Rep MMA business model is highly exposed to hurricane impacts:
 - Dependence on tourist arrival numbers into Punta Cana airport and sea port, which would fall (maybe stop entirely)
 - Dependence on the quality of ecosystem services provided in the MMA; a healthy coral reef is likely to attract more visitors willing to pay an entry fee than a degraded or dying reef
 - As revenue suddenly falls, expenditure will rise - rapid recovery work to the ecosystem and repair / replacement of equipment will be necessary, as well as there being a long-term additional cost burden to achieve the required conservation outcomes
- A large hurricane passing close to or over the MMA could produce all three of these potential downsides simultaneously and have impacts lasting many months and even years in the case of the ecosystem impacts
- Hurricane insurance, purchased on a parametric basis, is an effective hedge against this major risk to the operations of an MMA co-management company and therefore the investment made by investors in that company



Example: Parametric Catastrophe Wrapper for Belize

- Innovative “inverted avocado” structure developed to capture most impactful events
 - Cat 3 storms need to be closer to economic focus area of Belize City and the Cayes
 - More intense storms do similar damage from further away
 - Also triggers for very wet lower-intensity hurricanes and for two hurricanes in a season
- Structure successfully differentiates (i.e., triggers for) the four most impactful events (>25% GDP impact) during the 121-year historical period
- Pay-out protects the semi-annual debt repayment by Government of Belize under the recently completed debt restructuring for marine conservation led by TNC-NatureVest and Credit Suisse
 - “Cat Wrapper” contributed to 3-level jump in S&P’s sovereign credit rating for Belize following closure of the deal

